

Machine Intelligence with Art

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What is Machine Intelligence?

- Machine intelligence is advanced computing that enables a technology (a machine, device, or algorithm) to interact with its environment intelligently, meaning it can take actions to maximize its chance of successfully achieving its goals.
- The concept of machine intelligence highlights the intersection of machine learning and artificial intelligence, as well as the broad spectrum of opportunities and approaches in the field.

WIRED
OBSSESSED



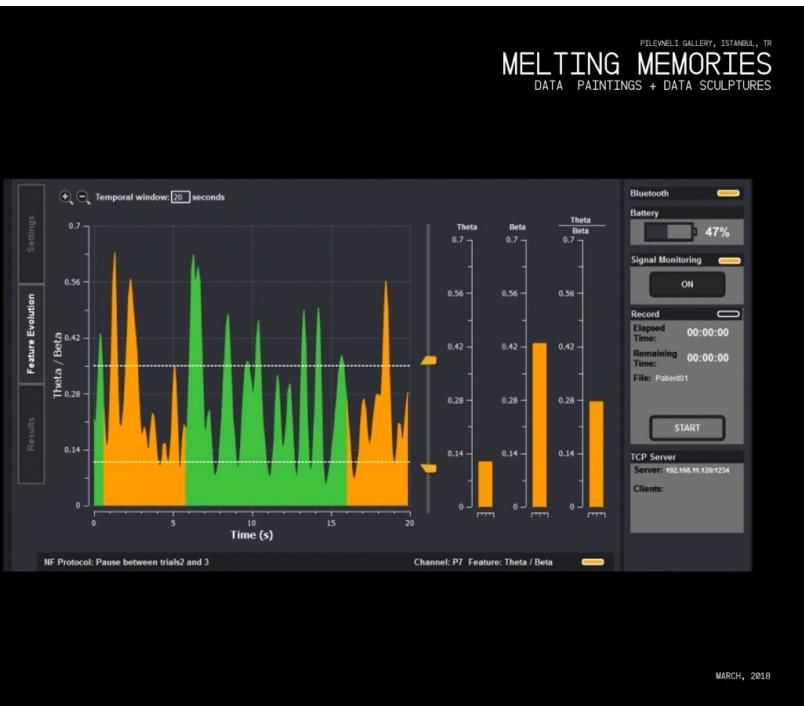
“Melting Memories”

Technology : Archive + Machine Learning + Neuroscience

- Comprising data paintings, augmented data sculptures and light projections media artist Refik Anadol's large scale works melting memories takes viewers inside the human brain. motion graphics displayed on 16 x 20 ft LED media screens.
- The works are a result of the Anadol's experiments with the advanced technology tools provided by the neuroscape laboratory, a brain specialist research center at the university of California. each one attempts to visualize the motor movements within the brain and recalls memories.
- Anadol gathers data on the neural mechanisms of cognitive control from an EEG (electroencephalogram) that measures changes in brain wave activity and provides evidence of how the brain functions over time
- These data sets constitute the building blocks for the unique algorithms that the artist needs for the multi-dimensional visual structures on display.

Data Collection process with 32 channel EEG protocol

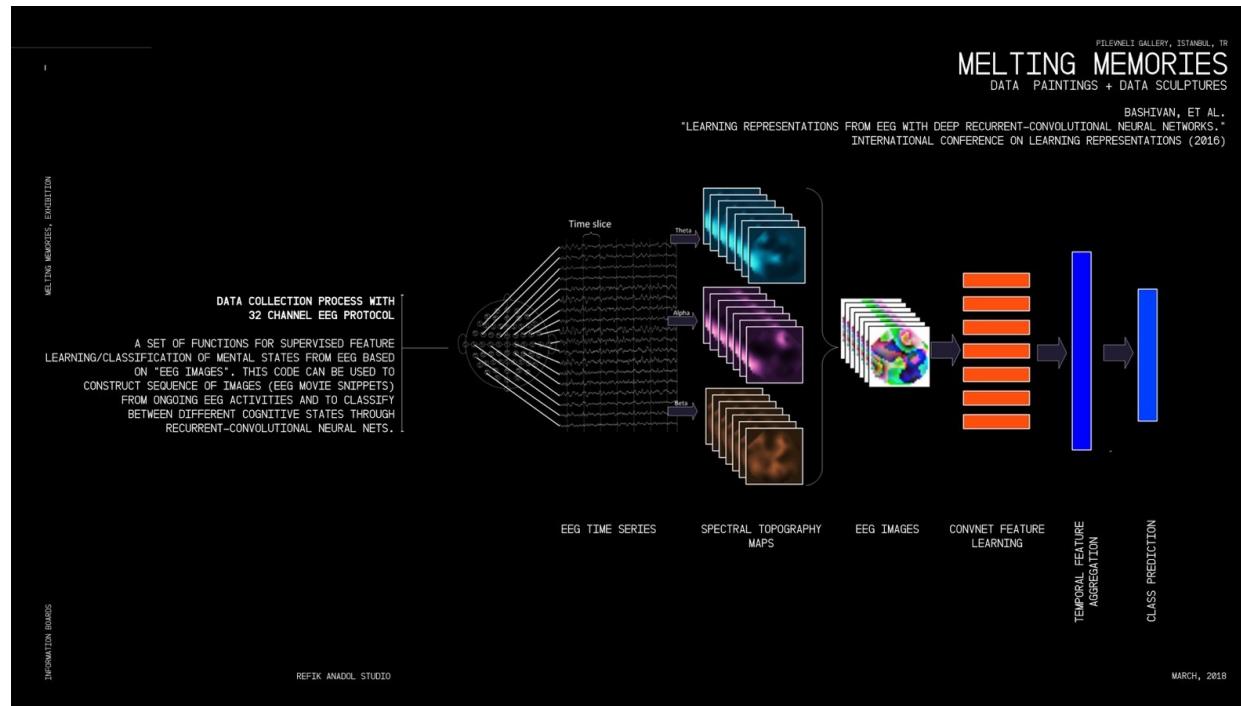
MELTING MEMORIES EXHIBITION



REFIK ANADOL STUDIO

MARCH, 2018

INFORMATION BOARDS



REFIK ANADOL STUDIO

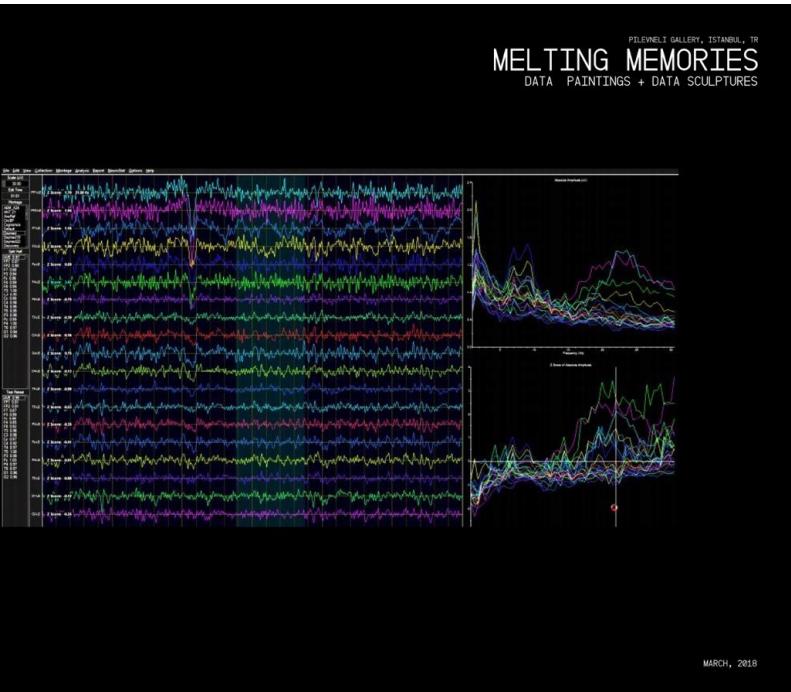
MARCH, 2018

Theta waveform superimposed on beta channel(symmetrical band) used to determine if brain activity has a positive/negative form

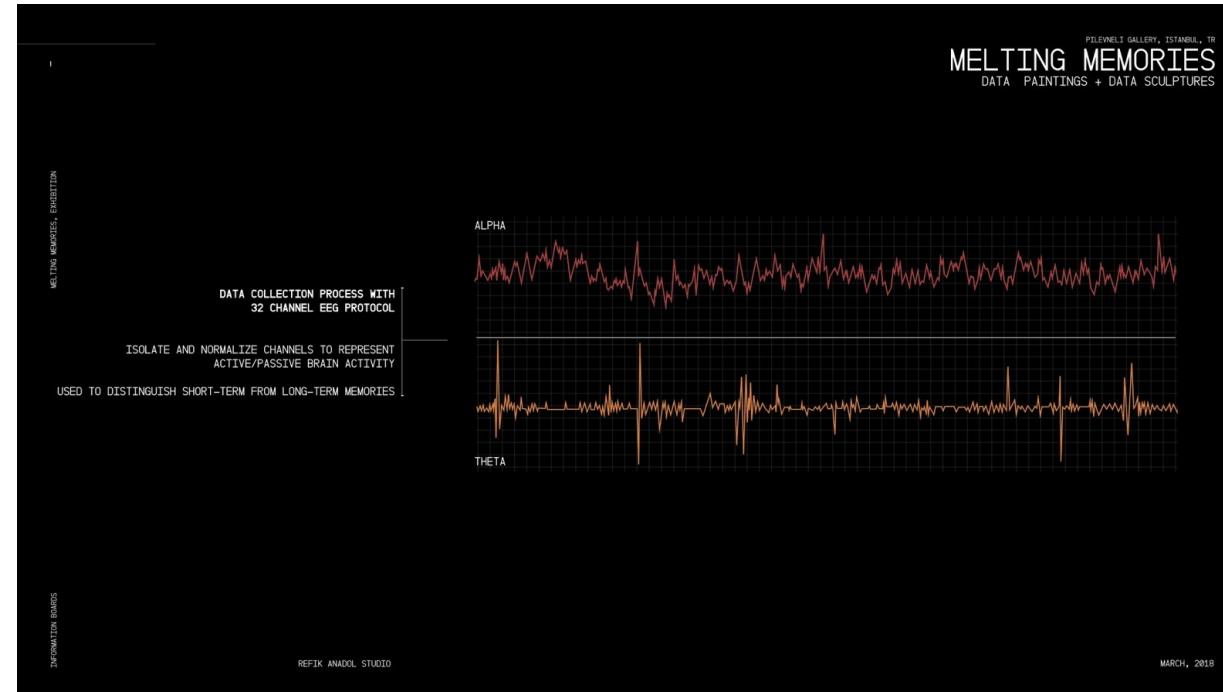
A set of functions for supervised feature learning/classification of mental states from EEG based on "EEG Images". This code can be used to construct sequence of images (EEG Movie Snippets) from ongoing EEG activities and to classify between different cognitive states through recurrent-convolutional neural net.

Data Collection process with 32 channel EEG protocol

MELTING MEMORIES, EXHIBITION



INFORMATION BOARDS



Data filtered with FFT and split across EEG channels. Each channel represents one node of localized brain activity.

Isolate and normalize channels to represent active/passive brain activity.
Used to distinguish short-term from long-term memories.



“WDCH(Walt Disney Concert Hall)-Dreams”

DATABASE - IMAGES BREAKDOWN



TOTAL:

587,763 FILES
3.3 TB

ARCHIVE PHOTOS:

3036 FILES
97.1 GB
PHYSICAL OBJECTS
IN ARCHIVE

VIDEO FRAMES:

52829 FILES
120.1 GB
VIDEO FRAMES FROM
OPTICAL FLOW

MATHEW IMAGING:

425722 FILES
2.4 TB
PERFORMANCE PHOTOS

EDUCATION:

42113 FILES
302.7 GB
YOLA + PR PHOTOS

WDCH PRE-OPENING:

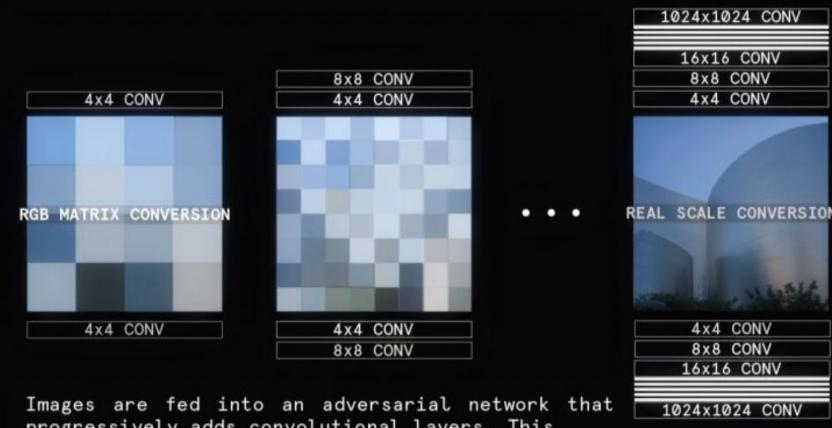
5530 FILES
33.2 GB
FEDERICO ZIGNANI RECORDS

LA PHIL IMAGE ARCHIVE



Photos are collected from social media API's in order to generate an image dataset. Data is used as the visual representation of LA Phil in an architectural context

GAN UPSCALING



FRAME-PREDICTED HALLUCINATIONS



Machine hallucinations represent vision and the perspective of the institution in the context of the public's architectural memories

Photos are collected from social media API's in order to generate an image dataset. Data is used as the visual representation of LA Phil in an architectural context.

Images are fed into an adversarial network that progressively adds convolutional layers. This improves performance at higher spatial resolutions.

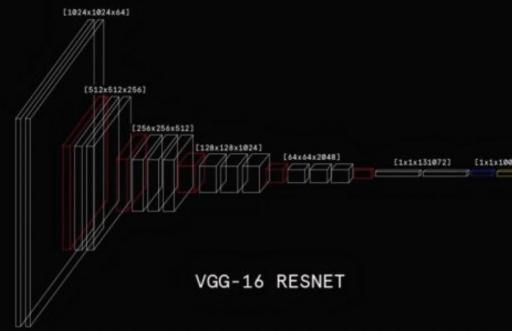
Machine hallucinations represent vision and the perspective of the institution in the context of the public's architectural memories.

LA PHIL IMAGE ARCHIVE



Over 500,000 photos of LA Phil performances and historic moments are collated into a massive image dataset

MACHINE LEARNING CLASSIFICATION



VGG-16 RESNET



t-SNE algorithm used to cluster the entirety of LA Phil's visual memories

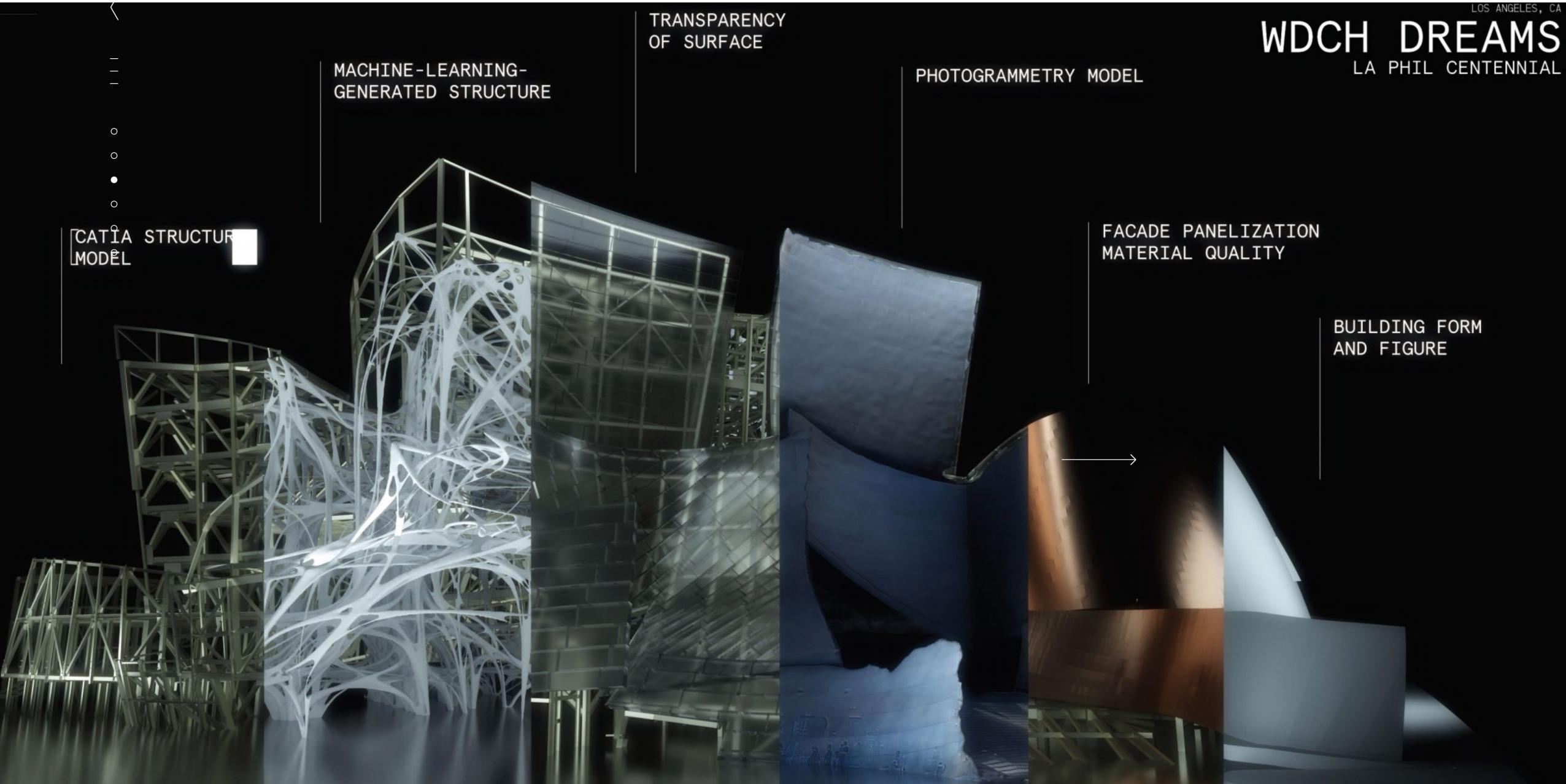
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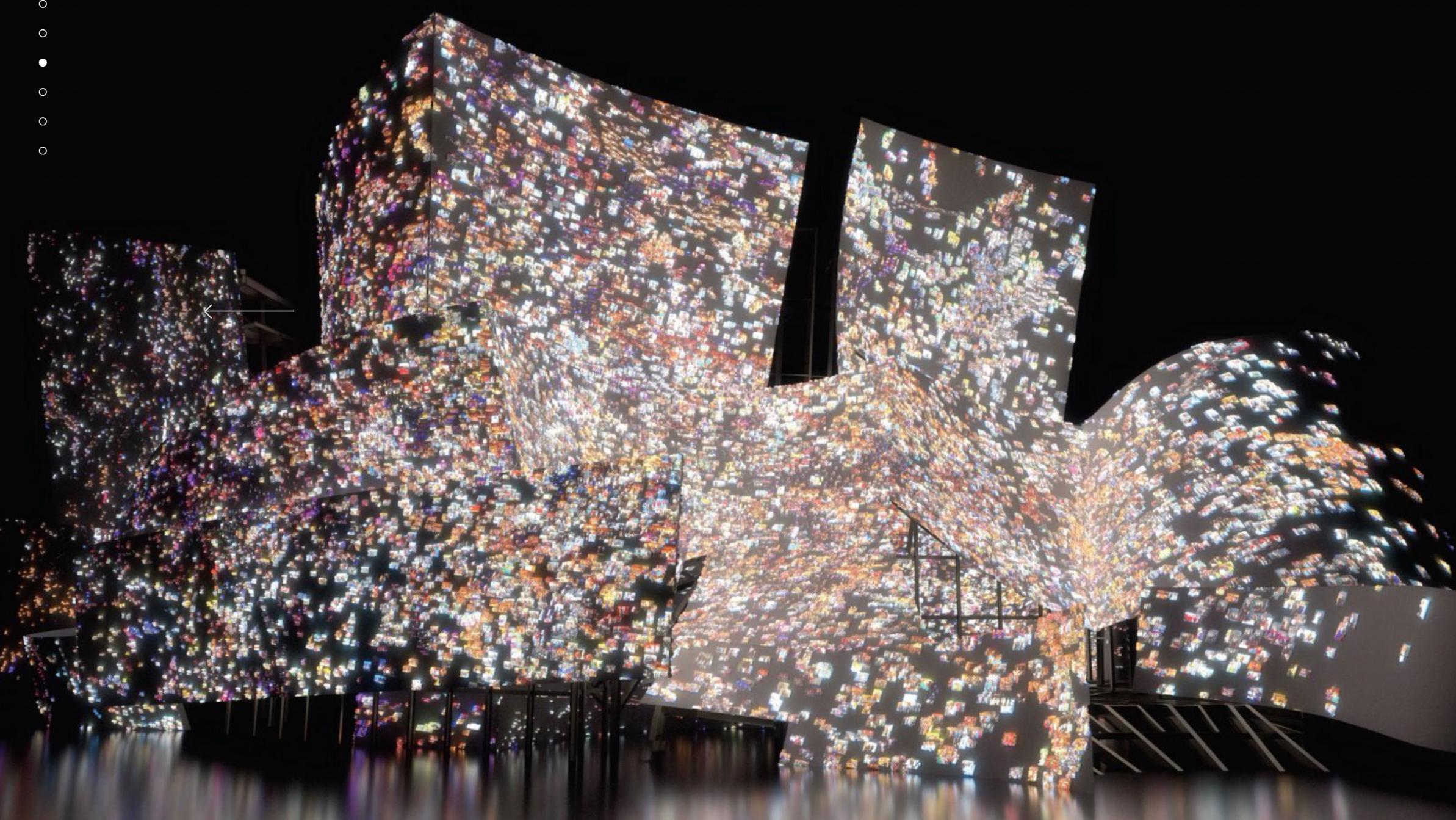
Compiled dataset is fed into a modified **VGG-16 resnet** configured to utilize a proprietary Google neural stack. Features are extracted from every image in dataset to be classified in the context of LA Phil's visual history.

t-SNE algorithm used to cluster the entirety of LA Phil's visual memories.

WDCH DREAMS

LA PHIL CENTENNIAL





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References

- <https://www.youtube.com/watch?v=I-EIVlHvHRM>
- <https://www.youtube.com/watch?v=UxQDG6WQT5s>
- <https://refikanadol.com/works/melting-memories/>
- <https://refikanadol.com/works/wdch-dreams/>
- <https://refikanadolstudio.com/projects/melting-memories/>

Thank you